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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,801	12/28/2001	Jae Doeg Lim	SAMS01-00166	1745

7590

07/02/2004

Docket Clerk  
P.O. Drawer 800889  
Dallas, TX 75380

EXAMINER
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ABRAHAM, ESAW T

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/035,801	Applicant(s) LIM ET AL.	
	Examiner Esaw T Abraham	Art Unit 2133	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 January 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims **1-25** are presented for examination.

#### *Claim objections*

2. Claims **1, 6, 18, and 22** are objected to because of the following informalities:

The applicant must choose the claimed element between a “channel encoder” and an “apparatus”. The examiner would like to suggest to the applicant to re-write as “A digital data communication system comprising” either “a channel encoder” or “an apparatus” and remove the extra word “For use in” from the claims (see claims 1, 6, 18 and 22).

Appropriate correction is required.

#### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims **6 and 14**, are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

In claim 6, line 19, “output of said s coupled” and in claim 14, line 18 “output of said s coupled” are not clearly understood and the interconnections of such elements with the first turbo encoder can neither be visualized in the drawings nor can be clearly understood from the claim language for proper examination purposes.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims **1-5, 10-13 and 18-21**, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yi (U.S. PN: 5,907,582).

As per claims **1, 10 and 18**, Yi teach or disclose a digital communication system comprising first turbo encoder for turbo encoding digital source information, an interleaver for interleaving the digital source information, second turbo encoder for turbo encoding the interleaved digital source information into a second code sequence (see claim 16, section A 1-3).

As per claims **2, 11 and 19**, Yi teach all the subject matter claimed in claim 1 including first and second puncturers for selectively replacing data in the first and second code sequences (see claim 16, section A 4 and 5).

As per claim **3**, Yi teach all the subject matter claimed in claims 1 and 2. Although, Yi is silent on how the apparatus is capable of providing a packet data error rate less than one percent when 64-QAM modulation is used, this practice is deemed to be inherent to the system of Yi as Yi's invention provide code diversity with packet combining to result in an overall improved performance through very high coding gain and since the Yi's system performance is improved through a very high coding, by virtue of the fact the system of Yi reduce a packet data error rate and improve the information bit rate.

As per claims **4, 12 and 20**, Yi teach all the subject matter claimed in claim 1 including Yi in figure 3, teaches a turbo decoding comprising first and second convolutional encoders (see elements 134 and 136) and an interleaver (132) coupled to the second convolutional encoder for convolutionally encoding interleaved data.

As per claims **5, 13 and 21**, Yi teach all the subject matter claimed in claim 1 including Yi in figure 3, teaches a turbo decoding comprising first and second convolutional encoders (see elements 134 and 136) and an interleaver (132) coupled to the second convolutional encoder for convolutionally encoding interleaved data.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims **6-9, 14-17 and 22-25**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yi (U.S. PN: 5,907,582) in view of Park et al. (U.S. PN: 6,397,367).

As per claims **6, 14, and 22**, Yi teach or disclose a digital communication system comprising first turbo encoder for turbo encoding digital source information, an interleaver for interleaving the digital source information, second turbo encoder for turbo encoding the interleaved digital source information into a second code sequence (see claim 16, (1)-(3)). Yi further teaches a first and second multiplexers for multiplexing the source data information together with first punctured code sequence and second punctured code sequence (see claim 17). Yi **does not explicitly** teach that a multiplexer capable of multiplexing data from said first turbo encoder and from said second turbo encoder. **However**, Park et al. in figure 5 teach a first channel coder (first turbo encoder) (502) and a second channel coder (second turbo encoder) (512) output turbo encoded data and coupled to a multiplexer (503) whereby the multiplexed data is rate matched at a rate matcher (504) by symbol repetition, puncturing or puncturing-after-symbol repetition (see col. 2, lines 22-33). **Therefore**, it would have been obvious at the time the invention was made to one of ordinary skill in the art to include a multiplexer as taught by Park et al. for multiplexing data outputted from first and second turbo encoders. **This modification** would have been obvious because a person having ordinary skill in the art would have been motivated to do so because providing a multiplexer that are selecting data from the first and the second turbo encoders is a known in the art of transmitting communication systems (see col. 2, lines 22-24) for multiplexing data coming from different channels.

As per claims **7, 15 and 23**, Yi in view of Park et al. teach all the subject matter claimed in claims 6, 14 and 22 including Park et al. in figure 5 teach a first channel coder (first turbo

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encoder) (502) and a second channel coder (second turbo encoder) (512) output turbo encoded data and coupled to a multiplexer (503) whereby the multiplexed data is rate matched at a rate matcher (504) by symbol repetition, puncturing or puncturing-after-symbol repetition (see col. 2, lines 22-33).

As per claims **8, 16 and 24**, Yi in view of Park et al. teach all the subject matter claimed in claims 6, 14 and 22 including in figure 3 Yi teaches a turbo decoding comprising first and second convolutional encoders (see elements 134 and 136) and an interleaver (132) coupled to the second convolutional encoder for convolutionally encoding interleaved data. Furthermore, Park et al. in figure 2 disclose a convolutional turbo coder includes a first constituent coder (201), a second constituent coder (202) and an interleaver (211) interconnected between the constituent coders (201 and 202), an RSC coder is typically used, which is well known in the art (see col. 1, last paragraph).

As per claims **9, 17 and 25**, Yi in view of Park et al. teach all the subject matter claimed in claims 6, 14 and 22 including in figure 3 Yi teaches a turbo decoding comprising first and second convolutional encoders (see elements 134 and 136) and an interleaver (132) coupled to the second convolutional encoder for convolutionally encoding interleaved data. Furthermore, Park et al. in figure 2 disclose a convolutional turbo coder includes a first constituent coder (201), a second constituent coder (202) and an interleaver (211) interconnected between the constituent coders (201 and 202), an RSC coder is typically used, which is well known in the art (see col. 1, last paragraph).

### *Conclusion*

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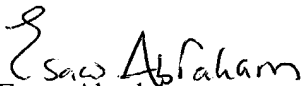
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 6,061,387 Yi

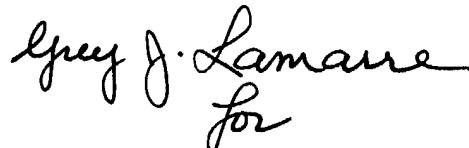
7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

  
Esaw Abraham

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for  
Albert DeCady  
Primary Examiner